

THE NATURAL LAWN & GARDEN
Healthy Landscapes for a Healthy Environment

Preliminary

Natural Pest, Weed & Disease Control



WHY MANAGE YOUR GARDEN NATURALLY?

Insects, spiders, and other crawling or flying creatures are a vital part of healthy gardens. Most perform important jobs like pollinating flowers, recycling nutrients and eating pests. In fact, less than 1% of garden insects actually damage plants. Unfortunately, the pesticides often used to control pests and weeds are also toxic to beneficial garden life — and may harm people, pets, salmon and other wildlife as well.

FOLLOW THESE BASIC STEPS TO NATURAL PEST, WEED AND DISEASE CONTROL

- ❖ **Create a healthy garden to stop pest problems before they start.** Healthy plants and soil not only resist pests and diseases, they also encourage beneficial garden life.
- ❖ **Identify pests before you spray, stomp or squash.** When you see damaged plants or what appear to be pests, use the Natural Pest Control Resources on page 10 and 11 to identify the “suspects” first. What you think is a pest may actually be a beneficial insect!
- ❖ **Give nature a chance to work.** Do not try to eliminate pests at the first sign of damage. Garden pests feed beneficial insect populations and allow them to grow.
- ❖ **Use the least toxic pest controls available.** You can often control pests by using traps or barriers, or by simply removing large pests and infested plant parts. These methods do not harm beneficial garden life or the environment. If pesticides are the only way to control a problem, look for the least toxic ones and closely follow the application tips outlined on pages 6 and 7.



START WITH PREVENTION

- ❖ **Build healthy soil to grow healthy plants.** Amend and mulch entire growing beds with compost, and fertilize moderately with natural organic or slow-release fertilizers to grow vigorous, pest-resistant plants. See the *Growing Healthy Soil* guide* for more details.
- ❖ **Plant right.** Place each plant in the sun and soil conditions it prefers. Select varieties that are known to grow well in your garden conditions and resist common pest and disease problems. See the *Choosing the Right Plants* guide* for help selecting plants ideal for each spot in your garden.
- ❖ **Give your plants some space.** Good air circulation can prevent or reduce many disease and pest problems. Space plants so they have plenty of room to grow, and remove some when they become too crowded.
- ❖ **Water wisely.** Overwatering and underwatering are two of the most common causes of plant problems. Observe plants and check soil as deep as roots grow before and after watering to make sure plants get what they need, but not too much. Water early in the day or use soaker hoses to prevent diseases caused by wet leaves. For more details, see the *Smart Watering* guide.*
- ❖ **Clean up.** Remove weeds, wood boards and other yard debris that can harbor pests and disease. Fallen leaves and fruit from plants like apple trees and roses with persistent diseases such as scab, rust and mildew should be put in curbside yard waste collection containers—not in home compost piles, ravines, streams or lakes.
- ❖ **Diversify and rotate annual crops.** Grow a variety of plants to prevent problems from spreading, as well as to attract pest-eating insects and birds. Do not plant the same type of annual vegetables in the same spot each year; crop rotation prevents pests and diseases from building up in the soil.



Good bug:
Lady beetle larva



Bad bug: Aphids

When is it a pest?

- ❖ **Pest** refers to an insect, animal, plant or micro-organism that causes problems in the garden.
- ❖ **Beneficials** are organisms in the air, on the ground or in the soil that do good things for your garden, like pollinating flowers, feeding on insect pests, or improving soil.
- ❖ **Some pests are also beneficials.** For example, yellow jackets are both predators of pests and painful to humans. When considering any controls, weigh a creature's damage against damage to the entire community of garden life.



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WHAT TO DO IF A PEST PROBLEM DEVELOPS

Use Physical Controls First

Many pests can be kept away from plants with barriers or traps, or controlled by simply removing infested plant parts. These controls generally have no adverse impact on beneficial garden life, people or the environment.

Removal

Pests and diseased plant parts can be picked, washed or vacuumed off plants to control infestations. In fact, pulling weeds is a natural pest control!

Handpicking can be effective for large pests like cabbage loopers, tomato hornworms, slugs and snails.

Pruning out infestations of tent caterpillars is effective on a small scale. Control leaf miners on beets or chard by picking infected leaves. Put infestations in the garbage or curbside yard waste collection containers — not in home compost piles, which do not get hot enough to destroy pests.

Washing aphids off plants with a strong spray of water from a hose can reduce damage. Repeated washings may be required, as this process does not kill the aphids.

Traps

It is possible to trap enough pests like moths and slugs to keep them under control. You can also use traps for monitoring pest numbers to determine when controls may be necessary. Two simple and effective pest traps include:

Cardboard or burlap wrapped around apple tree trunks in summer and fall will fool codling moth larvae into thinking that they have found a safe place to spin their cocoons as they crawl down the tree to pupate. Traps can be peeled away periodically to remove cocoons.

Slug traps drown slugs in beer or in a mixture of yeast and water.

Barriers

It is often practical to physically keep pests away from plants. Barriers range from 2-inch cardboard “collars” around plants for keeping cutworms away to 8-foot fences for excluding deer.

Floating row covers are lightweight fabrics that let light, air and water reach plants, while keeping pests away — they are useful for pests like rust flies on carrots, leaf miners on spinach, and root maggots on cabbage, broccoli and cauliflower.

Mesh netting keeps birds away from berries and small fruit trees.

A band of sticky material around tree trunks stops ants from climbing trees and introducing disease-carrying aphids.



Washing aphids from underside of leaf



Copper slug barrier



Protecting a crop with a floating row cover

Repellents

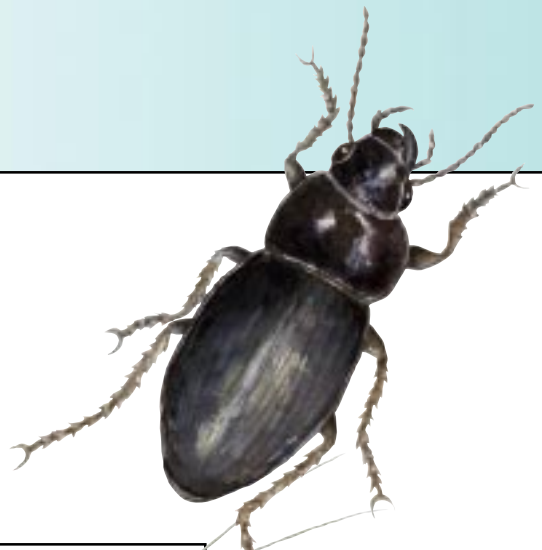
A variety of homemade and commercial preparations can be used to keep pests away from plants. Many gardeners claim repellents work, although some are not consistently effective in scientific trials.

A mixture of **raw eggs blended with water** produces a taste and odor that offend deer; some gardeners add garlic and hot pepper. Spraying this mix onto plant foliage can repel deer for several weeks, or until it is washed off by rain or sprinklers.

Garlic oil and extracts are used to repel a variety of insect pests, and also work as fungicides.

Meet The Beneficials!

Spraying any pesticide may kill more beneficials than pests. Think twice before you spray.



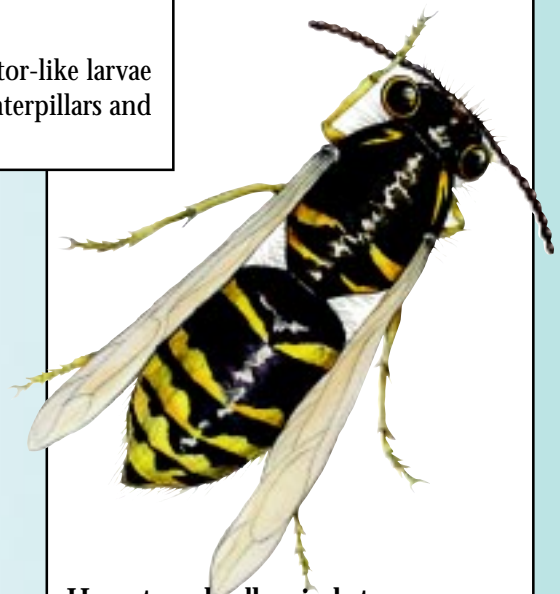
Ground beetles eat slug eggs and babies, plus other soil-dwelling pests.



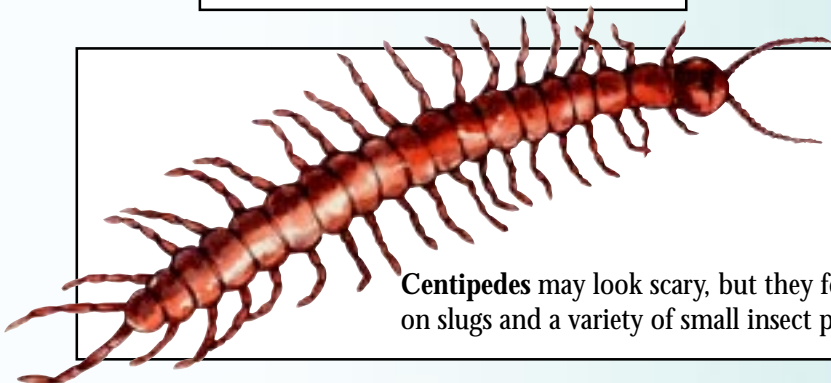
Lacewings and their alligator-like larvae eat aphids, scales, mites, caterpillars and other pests.



Lady beetle larvae and adults feed on soft-bodied insects such as aphids, mealybugs, scale insects, and spider mites as well as insect eggs.



Hornets and yellow jackets are effective predators. However, controls may be necessary if they pose a threat to people or pets.



Centipedes may look scary, but they feed on slugs and a variety of small insect pests.



2

USE LEAST-TOXIC PESTICIDES WHEN PHYSICAL CONTROLS DON'T WORK

The pesticides listed below have a low toxicity or break down quickly into safe byproducts when exposed to sunlight or the soil are the least likely to have adverse effects. However, even these pesticides can be toxic to beneficial garden life, people, pets and other animals — especially fish. They should be used carefully and kept out of streams, lakes and Puget Sound. Refer to Resources on page 10.

Soaps, Oils and Minerals

- ❖ **Horticultural oils** smother mites, aphids and their eggs, scales, leaf miners, mealybugs and many other pests; they have little effect on most beneficial insects.
- ❖ **Horticultural soaps** dry out aphids, white flies, earwigs and other soft-bodied insects. They must be sprayed directly onto the pests to work, so repeated applications may be necessary. There are also soap-based fungicides and herbicides.
- ❖ **Sulfur** controls many fungal diseases such as scab, rust, leaf curl and powdery mildew without harming most animals and beneficials. For greater effectiveness, sulfur can be mixed with lime. Sulfur is also frequently combined with other materials to create more toxic fungicides.
- ❖ **Baking soda** (1 teaspoon) mixed with dishwashing liquid (a few drops) and water (1 quart) has been used by rose growers to prevent mildew. A commercial product is also available that contains potassium bicarbonate, which is similar to baking soda.
- ❖ **Iron phosphate slug baits** are less toxic than other slug baits and not as hazardous to dogs.

Botanicals

These plant-derived insecticides degrade quickly in the sun or soil. However, most are initially toxic to people, animals, fish and beneficial garden life.

Use cautiously and follow label directions closely, just as when applying synthetic pesticides.

- ❖ **Neem oil** kills and disrupts feeding and mating of many insects, including some beneficials. Also an effective fungicide, neem oil is the botanical that is least toxic to people, animals, birds and fish.
- ❖ **Pyrethrum, ryania and sabadilla** kill many tough pests, but are also quite toxic to beneficial insects, people, fish and other animals. *These pesticides should only be used as a last resort.*

Biocontrols

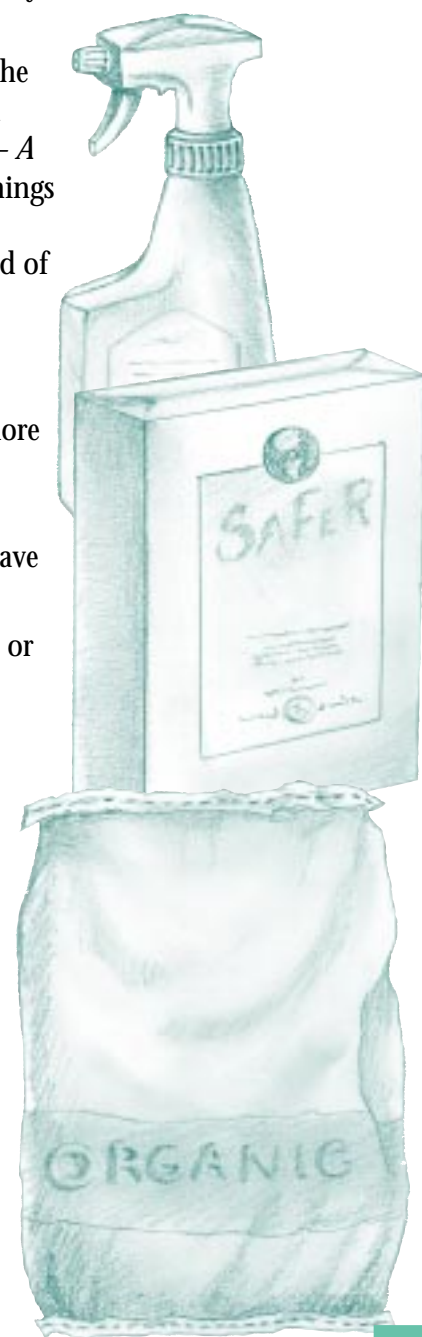
- ❖ **Bacillus thuringiensis (Bt)** is a common, commercially available bacterium that poisons caterpillar pests, including cutworms, armyworms, tent caterpillars, cabbage loopers, and corn earworms. Bt is not toxic to people, animals, fish or insects — although it can kill caterpillars of non-pest butterflies and moths.
- ❖ **Predatory nematodes** kill a wide variety of pests, including cutworms, armyworms, root maggots, crane fly larvae, root weevil larvae and other soil-dwelling pests. Proper soil temperature and moisture are required for nematodes to be effective.
- ❖ **Beauveria bassiana** is a commercially available fungus that destroys an extensive range of pest insects.
- ❖ **Beneficial insects** like ladybugs and lacewings can be purchased and released. A healthy and diverse garden will usually have lots of them around already.
- ❖ **Compost teas** use compost organisms to help control leaf and root diseases. They are sometimes effective, and they won't harm any beneficial organisms. Call the Natural Lawn & Garden Hotline at (206) 633-0224 for more information on using compost teas and other biocontrols.



USE SYNTHETIC PESTICIDES ONLY AS A LAST RESORT

When physical and least-toxic controls fail to control a pest, other pesticides may be used as a final resort. But first, consider your pest problem. Is it the result of poor plant placement? Is it likely to recur after pesticide treatment? Keep in mind that scientists have found 23 pesticides — including four commonly used insecticides — in local streams, some at high enough levels to harm fish and what they eat.

- ❖ **Don't use services that spray insecticides or herbicides on a prescheduled plan.** Preventive sprays can disrupt natural controls, and may do more harm than good. Fungicides are an exception because they only work when applied prior to the appearance of the problem — use the least toxic fungicides, only on plants which have been infected in previous years.
- ❖ **Look for the least toxic pesticide.** Ask nursery staff for help identifying the least toxic pesticides for your pest problem. Or call the Natural Lawn and Garden Hotline at (206) 633-0224 and ask for *Grow Smart, Grow Safe — A Consumer Guide to Lawn and Garden Products*. Avoid products with warnings like “highly toxic,” “causes permanent eye damage,” or “may be fatal if swallowed.” Choose “ready-to-use” products, which are safer to use instead of more toxic concentrates which require mixing.
- ❖ **Don't use broad-spectrum insecticides** like diazinon, chlorpyrifos (Dursban), malathion and carbaryl. These are likely to kill more of the natural enemies than the pests. Pest populations may soar and become more of a problem than before they were sprayed.
- ❖ **Avoid “weed and feed” and other pesticides that are broadcast over the entire yard.** Instead, spot apply the least toxic product, only where you have a pest or weed.
- ❖ **Buy only as much as you need.** Unused pesticides are dangerous to store or dispose, and expensive for local governments to dispose of.
- ❖ **Read and follow label directions carefully.** Only use pesticides on the plants and pests listed on the label, and apply exactly according to label directions. Be sure to wear specified protective clothing and equipment, and keep children and pets off application areas for the specified period of time on the label.
- ❖ **Apply only when and where pests are present.** Timing is critical with all pest control. Most pesticides should not be used as a preventative, except fungicidal tree sprays.
- ❖ **Dispose of unused pesticides and containers properly.** Empty containers should be disposed of in your garbage. Dispose of unused pesticides at household hazardous waste disposal sites; see the Resources List on page 11 for more information.





Have you seen these “noxious” weeds?

There are a few non-native “noxious weeds” that property owners are required to control by Washington State law to prevent their spread. Check the State’s noxious weed website for a list, at www.wa.gov/agr/weedboard



Giant Hogweed

WHAT ABOUT WEEDS?

A “weed” is simply a plant in the wrong place. Some weeds compete with desirable plants, but many are merely aesthetic concerns. For instance, white clover is often considered a weed in lawns, yet it stays green when dry conditions turn lawns brown, and its roots support bacteria that transform nitrogen from the air into plant fertilizer. So clover feeds your lawn every time you mow!

- ❖ **Accept a few weeds in your lawn.** Target the problem weeds, and leave the others. Many people who see a lawn with 10-20 percent weed cover consider it healthy and good looking. For tips on maintaining a dense, healthy lawn that crowds out weeds, refer to the *Natural Lawn Care* guide.*
- ❖ **Prevention: don’t give weeds a chance.** Weeds thrive in bare soil and neglected garden areas. Plant spreading ground cover to outcompete weeds, or smother them with weed barriers and lots of mulch. See the *Growing Healthy Soils* guide* for more information on mulches.
- ❖ **Physical control: be a control freak with problem weeds.** A single weed flower can produce thousands of seeds. To prevent future infestations, remove weeds before they go to seed. Cultivating with a hoe works well on young or shallow-rooted weeds in garden beds or paths. Long-handled pincer-type weed



Torches work on weeds in cracks or gravel



Using a weed puller

pullers work great for weeds with taproots like dandelion and thistle, especially in lawns when soil is moist. Propane weeding torches scorch and kill most weeds without damaging plants around them; repeated flame treatment may be needed for tough weeds. Be aware of fire hazards when using torches, as well as the potential to burn your feet. Spring and fall, when the ground is moist and weeds have just sprouted, is the safest and most effective time to use a torch.

- ❖ **Least toxic controls: corn, soap or vinegar?** Herbicides with low toxicity to beneficial garden life, people and wildlife include corn gluten — a milling byproduct which is used as animal feed — herbicidal soaps, and vinegar (acetic acid). Corn gluten prevents the growth of weed seedlings, but actually fertilizes established plants. It is sold under several brand names. Corn gluten's effect is short-lived, so applications must be timed to coincide with seed germination. Herbicidal soaps and vinegar both damage leaf cells and dry out plants. Tough weeds resist these herbicides or resprout from roots. Some concentrated vinegar products can cause permanent damage if accidentally splashed into the eyes. Ready-to-use dilutions are safer.

- ❖ **The last resort: spot apply synthetic herbicides.** When extreme weed problems call for treatment with synthetic chemical herbicides, carefully apply them (only as directed on the label) directly onto weed leaves. Do not use “weed and feed” or pre-emergent products, which spread toxic herbicides all over lawns or gardens and are likely to run off into streams and Puget Sound. *If you are applying an herbicide on a regular basis, there is probably a landscape design or soil problem that needs to be addressed.*



Spot apply the least toxic herbicide



Spreading mulch to prevent weeds





NATURAL PEST CONTROL RESOURCES

Call the Natural Lawn and Garden Hotline at (206) 633-0224 to ask a question, or to request other guides including *Natural Lawn Care*; *Growing Healthy Soil*; *Choosing the Right Plants*; *Smart Watering*; *Composting at Home*; *Natural Pest, Weed & Disease Control*; *Grow Smart, Grow Safe*; *How to Choose a Landscape Company*; *Good Bugs, Bad Bugs*; and a brochure on crane flies. Landscape professionals can request the series of *Pro-IPM* professional factsheets, or the report *Ecologically Sound Lawn Care*. Community groups, garden clubs, and landscape professionals can also request a Green Gardening program presentation to learn more about natural pest management methods. You can also visit www.savingwater.org to view many of these publications online. View the *Pro-IPM* series of factsheets at www.cityofseattle.net/util/proipm

Books For Gardeners

- ❖ ***Sunset Western Garden Problem Solver***. Photos and descriptions of many common pest, disease and weed problems, plus less-toxic ways to prevent and manage them.
- ❖ ***Rodale's Color Guide of Garden Insects***. Photos for identifying pests and beneficial insects, with recommended organic controls for many pests.
- ❖ ***Rodale Pest and Disease Problem Solver***. Photos and descriptions of many common pest and disease problems, plus less-toxic ways to prevent and manage them.
- ❖ ***Pests of Landscape Trees and Shrubs: An Integrated Pest Management Guide*** by Steven Dreistadt. Detailed descriptions of pests by plant type, as well as pest life cycles and controls.
- ❖ ***Pests of the Garden and Small Farm: A Grower's Guide to Using Less Pesticide*** by Mary Flint. Detailed descriptions of pests by plant type, plus pest life cycles, and controls.
- ❖ ***Common Sense Pest Control*** by Olkowski, Daar & Olkowski. Least-toxic solutions for home, garden, pets, and community.

WSU-King County Cooperative Extension Resources and Services

- ❖ **Master Gardener Clinics**. Master Gardener volunteers are available to answer questions and diagnose problems over the phone, or at clinics held regularly around the county. For phone help and clinic locations, call (206) 296-3440 between 10 A.M. and 4 P.M., Monday through Friday.
- ❖ **www.metrokc.gov/wsucce/ (click on Gardening)**. View Cooperative Extension publications on horticulture and pest management online, or link to Extension and Master Gardener programs in counties around Washington.
- ❖ **Dial Extension**. Select and listen to tapes on many gardening topics, 24 hours a day, at (206) 296-3425.



- ❖ **Publications.** Order many bulletins on growing plants and managing pests for a small charge at (800) 723-1763. Several authoritative books can also be ordered, including *Landscape Plant Problems: A Pictorial Diagnostic Manual*, and *Pacific NW Integrated Pest Management Manual*. Three books primarily for professionals, excellent for diagnosing plant problems by symptom, are *PNW Insect Management Handbook*, *PNW Plant Disease Management Handbook*, and *PNW Weed Management Handbook* (focus is on chemical controls).

Other Resources

- ❖ **Landscape Professionals.** Many landscape and nursery professionals are skilled in environmentally friendly landscaping. Find them at www.savingwater.org/landscape.htm by scrolling down to Landscape Industry Contacts, or call (206) 633-0224 and ask for the brochure *How to Choose a Landscape Company*.
- ❖ **Seattle Tilth.** To learn more about organic gardening classes, get directions to demonstration gardens, or to purchase the *Maritime NW Gardening Guide*, call (206) 633-0451.
- ❖ **Washington Toxics Coalition.** To purchase publications on non-toxic pest management strategies and products, call (206) 632-1545 or (800) 844-SAFE or go to www.watoxics.org
- ❖ **Local Hazardous Waste Management Program website.** To learn more about safer gardening and pest control, go to www.metrokc.gov/hazwaste/house/pests.html
- ❖ **University of California IPM.** For pest descriptions, photos and management options for home gardeners and landscape professionals, go to <http://axp.ipm.ucdavis.edu>

Pesticide Disposal and Emergencies

- ❖ **Poison Control.** In case of pesticide poisoning, call (800) 222-1222, or just call 911.
- ❖ **Washington State Department of Agriculture.** If you have a concern about a pesticide application or want to report a violation, call WSDA at (360) 902-2040.
- ❖ **Household Hazards Line.** For information on pesticide disposal, including the days, hours and locations of disposal facilities, call the Hazards Line at (206) 296-4692 or (800) ToxicEd.

* Refer to the back of this guide for a list of all of the free Natural Lawn & Garden guides and to find out how to obtain them.





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Bryn Mawr-Lakeridge Water & Sewer District
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King County Water District #45
King County Water District #49
King County Water District #85
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Lake Forest Park Water District
Northshore Utility District
Olympic View Water & Sewer District
Seattle Public Utilities
Shoreline Water District
Soos Creek Water & Sewer District
Woodinville Water District

SAVING WATER PARTNERSHIP

For TTY assistance, please call (206) 233-7241.
This information can be made available on request
to accommodate people with disabilities and
those who need language assistance.



...and the Local Hazardous Waste Management Program in King County

To request a Natural Lawn & Garden Guide,
call the Natural Lawn & Garden Hotline
at (206) 633-0224
or visit us at www.savingwater.org

To learn more about water conservation,
call (206) 684-SAVE (684-7283)
or visit us at www.savingwater.org

The Natural Lawn & Garden Series:

- *Natural Lawn Care*
- *Growing Healthy Soil*
- *Smart Watering*
- *Choosing the Right Plants*
- *Natural Pest, Weed & Disease Control*
- *Composting at Home*